

THE DEVELOPMENT OF INDONESIAN NATIONAL QUALIFICATIONS FRAMEWORK (INQF) - BASED ELECTRICAL AND ELECTRONIC SUBJECT AT VOCATIONAL HIGH SCHOOL KAL-1 SURABAYA

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Abstract

Purpose of Study: Ineffective implementation of curriculum 2013 and low quality of vocational school graduates underlay the present study. The Presidential Regulation of the Republic of Indonesian number 8 year 2012 stipulates that the implementation of Indonesian National Curriculum Framework-based on curriculum 2013 will improve the quality of vocational high school graduates at level 2 and their learning outcomes, including cognitive, affective, and psychomotor domains. The development of the Indonesian National Curriculum framework-based curriculum 2013 was an activity in generating an educational curriculum at an institutional level which aligns the needs of business and industry.

The design of this study was the 4-D models of Thiagarajan, namely 1) the definition; 2) design; 3) development; and 4) deployment, but this was only conducted up to the development stage.

Methodology: Regarding the background, the research questions were formulated as follows: (1) how is the validity, practicality, and effectiveness of the instructional design of the Basic Electrical and Electronic subject?; (2) how is the students' response to the instructional design of the Basic Electrical and Electronic Subject?; and (3) how are the results of students' learning outcomes of Basic Electrical and Electronic Subject?.

Results: This study aimed to find out: (1) the level of validity, practicality, and effectiveness of the instructional design of the Basic Electrical and Electronic Subject; (2) the students' response of the instructional design of the Basic Electrical and Electronic Subject; and (3) the students' learning outcomes of the Basic Electrical and Electronic Subject.

Implications/Applications: The conclusion of this research is: 1) the average score on the validity of the instructional design was 3.722 (very high), the average score on its feasibility was 3.72 (very practical), while the average score of its effectiveness was 71.87 (effective); 2) the students' responses to the instructional design were 92%, which was satisfactory; and 3) the average score of the students' learning results was 85, over the minimum score determined, with the learning mastery of 100%.

Keywords: Development, Curriculum 2013, Indonesian National Curriculum Framework.

INTRODUCTION

Education in vocational schools emphasizes more on the students to be able to follow the technology development and technology mastery in accordance with their respective fields so that the students will be able to become skilled, productive workforce to fill the existing job vacancy and able to create their own job field. According to Permendikbud number 54 of 2013 mentioned that the competency standards of which should have qualified vocational skills such as have the ability to think and act effectively and creatively in the realm of the abstract and the concrete as the development of learned at school independently. Therefore Vocational High School graduates are prepared to go directly to the work world or continue higher education. One of the most important components to improve the quality of vocational graduates is on the curriculum

Curriculum change in Indonesia is basically to improve the quality of education in Indonesia, changes in the curriculum in 1947, 1964, 1968, 1994, 1973, 1975, 1984, 1994, 1997 (revised Curriculum 1994), and 2004 (Competency-based curriculum), and Kurikulum 2006 (Curriculum Education Unit). In the process of improving the quality of education so curriculum Education Unit developed into Curriculum 2013.

Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 54 Year 2013 on Graduate Competency Standards for Primary and Secondary Education which states that the Graduate Competency Standards for Primary and Secondary Education was used as the main reference for the development of content standards, standardized processes, standards of education assessment, standards and education personnel, facilities and infrastructure standards, management standards, and standards of financing, one of Competency standards Graduates in question is Competency of Vocational High School.

Referring permendikbud number 54 in 2013 on content standards about that, it has been observed by the findings that the learning tools used in vocational KAL-1 Surabaya still need the practicality, effectiveness in the learning device the practicality here in question is the ease in use of the device learning, and effectiveness in question is the achievement of the objectives of learning undertaken by students as well as the learning has not yet obtained a positive response from students.

Student responses on learning are still negative, it can be seen from student interest due to the lack of understanding of students in the implementation of teaching and learning activities so that students are difficult to understand the material being taught by the teacher.

Student learning outcomes are not maximized, it can be seen from the evaluation of learning is done at the time of the learning activity is completed, there are still many students who scored below the Standard of Minimum.

In particular, this study aims to determine: (1) the level of validity, practicality, the effectiveness of learning tools that have been developed; (2) The students' response to learning tools which have been developed; and (3) the results of student learning.

THEORETICAL OF REVIEW

1. Development of Curriculum 2013

Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 60 Year 2014 about Curriculum 2013 Vocational school / Madrasah Aliyah Vocational that the subjects of specialization in vocational Group C as referred to in paragraph 1 letter C is a curricular course aimed at developing competence attitudes, competencies, knowledge, and competence skills of learners in accordance with their interests, talents and/or abilities in the field of Vocational Program Vocational and Package of Vocational.

Below is a map of curriculum development. (Hamalik, Umar. (2007))

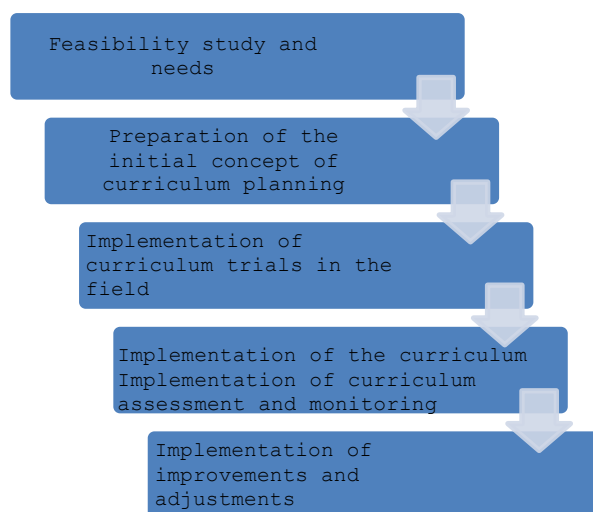


Figure 1. Map of the Curriculum Development

Phase 1: The feasibility study and the need for curriculum developers conduct a needs analysis and formulate program basics consideration for the curriculum development, for it is the developers need to study the documentation and/or field studies.

Phase 2: Preparation of the first concept planning of curriculum, the initial concept was formulated based on the formulation capabilities, formulate objectives, content, learning strategies in accordance with the pattern of the systemic curriculum.

Phase 3: Develop a plan for implementing the curriculum, the preparation of this plan include a syllabus, the development of teaching materials and other material resources.

Phase 4: The implementation of the curriculum in the field trials in the field of curriculum tests intended to determine the level of reliability, the possibility of the implementation and success, obstacles and problems that arise and supporting factors are available, and others relating to the implementation of the curriculum.

Phase 5: Implementation of the curriculum, there are two activities that need to be done, are:

The activity of dissemination, namely the implementation of the curriculum within the scope of a wider sample.

Implementation of a comprehensive curriculum that covers all educational units of the same level.

Phase 6: Implementation of curriculum assessment and monitoring, during the implementation of the curriculum, assessment, and monitoring with design curriculum and implementation of curriculum results and impact.

Phase 7: Implementation of repairs and adjustments, based on

the assessment and monitoring of curriculum acquired data and accurate information, which can then be used as a key ingredient in the curriculum when needed, or to adjust the curriculum to the state. Improvements made to some aspects of the curriculum.

Curriculum-Based of INQF

Indonesian Presidential Regulation Number 8 Year 2012 about the National Qualifications Framework Indonesia (INQF), explaining that the level of qualification of Vocational High School is at level 2 which has the following competencies:

- a. Being able to carry out one specific task, using the tools and information, and work of procedures, as well as performing with the quality being measured, under the direct supervision of his superiors,
- b. Has operational knowledge of basic and factual knowledge fields of specific work, so that they can choose the solution available to a common problem arising, and
- c. Responsible for your own job and can be given the responsibility of guiding others.

Validity, Practicality, Effectiveness of The Learning Device

Validity is the extent of the test was to measure what is intended to be measured. In general, there are three approaches to examining the validity of a measuring instrument, namely

- a. The validity of the contents,
- b. The construct validity, and
- c. The validity of the criteria. (Suryabrata, S. (2005))

In this research using validation instruments used to getting data about the opinions of experts (validator) to be the learning tools that have been developed, so that the guidance in revising the learning device (Silabus, RPP, LP, and LKS).

Practicality is that the device is arranged to consider the ease of learning. Ease, in this case, is that the structured learning device that is easy to understand and easy to implement or use. Instruments practicality learning device consists of observation sheets and questionnaires. Observation sheet used to determine the practicality of the device are developed, then the collection of data on the applying device learning and feedback of students and teachers about the learning device. At the end of the activities of teachers and students were asked to fill a questionnaire responses learning device.

Meanwhile, the effectiveness of the device is defined as the achievement of the objectives of learning undertaken by students and the learning students get a positive response. (Nieveen, Nienke.(1999)) Practicality learning device obtained from the application of learning that has been tested to the students. According (Sinambela. (2006)), the learning is said to be effective when achieving this goal, both in terms of student achievement of learning objectives as well as the maximum. Some indicators of the effectiveness of the study:

1. Achievement of mastery learning

The test is given at the beginning of the meeting (before learning) and the last of the lesson (after all the topics taught) developed in accordance with the indicators of learning. A student can be said to be complete when the value of individual students reach criteria of minimum value ≥ 70 . Further participants that a study has been completed there is seen 85% of students who took the tests have reached a score of criteria of minimum value. (Trianto. (2011))

- a. Achievement of the effectiveness of student activity (achieving the ideal time used by students to undertake any activities contained in the learning plan).

- b. Observation Sheet Capability Teachers Using Learning Tool, an instrument used to obtain data on the ability of teachers to implement learning activities using learning tools that have been developed. Observations were made during the learning takes place (from early learning to the end of the study) and the observations made by 2 observers. The ability of teachers to use learning device is said to be effective when the average ability of teachers to all the meetings achieve good minimum criteria ($2,50 \leq TKG < 3.49$)

The Response of Students to the Learning Device

Harvey and Smith define that the response is a form of readiness to take a stand either in the positive or negative form of the object or situation. This definition shows the distribution of responses by (Ahmadi. (1999)) is detailed as follows:

- a. Positive response: A response form, action or attitude that shows or shows, accept, acknowledge, agree and implement the norms that apply where the individuals live.
- b. Negative Response: The shape of the response, action or attitude that shows or shows rejection or disapproval to the norms that apply where the individuals live.

So it can be concluded that the students' response to the learning device is a social reaction of the student or students in response to the influence or stimulus in itself of situation repetition, others, such as acts of repetition of the teacher in the learning process, in this case, the response in question is a reaction and response students on the process of learning progressed.

Students' Learning Outcomes

According to (Sudjana, Nana. (2010)) The study is the ability of the students after receiving a learning experience.

According to Winkelin (Purwanto. (2010).) The learning result is a change that resulted in changing human attitudes and behavior.

RESEARCH METHODOLOGY

This study took place in Vocational High School KAL-1 Surabaya because this school is one of the school curriculum of 2013 so that there is the necessary data to be used as research objects.

1. Method of the Research

The method used in this research is the research and development, using the model of the four D (Four-D) Thiagarajan, there are four stages of research and development using the 4D model, namely the definition (define), design (design), development (develop), and the spread (disseminate). (Thiagarajan, S., Semmel, DS, & Semmel. (1974))

Here is an explanation of the stages above:

- a. The objective of defining stage is to determine and establish learning objectives. The initial stage will do a needs analysis learning device (RPP, LKS, and LP) in accordance with the curriculum of 2013 based on INQF then set a goal of learning and teaching materials as well as the obstacles that will be developed.

Stage define or definition has five steps which the analysis of the front end (front-end analysis), analysis of learning (learner analysis), analysis of the task (task analysis), analyzes the concept (concept analysis), set a goal (Specifying instructional objectives). (Nikolaeva, A. D., & Savvinov, V. M. (2016))

- b. The objective of the design phase is to design a learning device (RPP, LKS, and LP). This phase can be started with the preparation of the test grating, media selection, the selection format, and preliminary design.

Four steps in the design phase (design) are constructing the criterion-referenced tests (establishing the criteria and grating tests), media selection (selection of media), the format selection (selection format), initial design (preliminary design).

- c. The objective of the development stage (develop) is to modify the type of design of learning materials through the validation and expert assessment (expert appraisal). The empirical test phase is to test the learning device has been revised to obtain consistent and effective results.

The subject of research is the students of Engineering Audio Video class X Vocational High School KAL-1 Surabaya with the number of students 34 people. Data collected by observation, interview, validation, and test. Data were analyzed using descriptive analysis. Data validity and reliability of the instrument were analyzed using descriptive statistics with SPSS 17 (statistical package for social science), namely: 1) equal the average (mean) to get

a mean score validity of instrument device; 2) the correlation equation product moment to get the scores sheet validity Assessment Instrument (AI); and 3) the equation Cronbach alpha to get the reliability coefficient matter.

The development stage is the stage to produce the product development carried out by two steps, namely: (1) expert appraisal followed by a revision; and (2) developmental testing.

The purpose of this development stage is to produce the final form after going through a learning device revision based on the input of experts/practitioners and test result data. Steps taken at this stage are as follows:

Developmental testing, Field Tests performed to obtain direct input in the form of responses, reactions, comments the students, and bystanders towards learning tools that have been developed. According to (Golkar et al., 2014) testing, revision and re-testing continue until the device is obtained that is consistent and effective.

- d. Stage disseminate dissemination process is a final stage of development. Phase dissemination is done to promote the development of products to be acceptable to the user, whether an individual, a group or system. Manufacturers and distributors need to be selective and work together to package the material in an appropriate form. According to (Lobão, J., and Pereira, C. (2016)), "the terminal stages of final packaging, diffusion, and adoption are most important Although most frequently overlooked."

Some of the things that need attention in the dissemination are: (1) the analysis of users; (2) determine the strategy and theme; (3) the timing; and (4) the media selection.

2. Design of Research

The study design in the pilot phase will develop a design using a one-shot case study of the research done by carrying out a treatment plan to study subjects were followed by measuring the result of the need. The study design is described:

$$X \rightarrow O$$

Description:

X = Treatment which learning activities using learning tools that have been developed.

O = Observations result after treatment, That describes learning

according to the level of validity, practicality, the effectiveness of the learning tools that have been developed, students' responses to learning tools that have been developed, student learning outcomes after getting treatment.

Conclusion of Results and Discussion

1. Phase define

From the analysis of the existing device, data showed that the learning device consists of a syllabus, lesson plans, and sheet assessment, still not oriented to stimulate the desired learning outcomes and still not validated by experts. The test is only done at the end of the learning material, which only emphasizes aspects of knowledge, and test questions were never tested valid test. (Guerrero, Hilda, Shirley Polo, and Judith Martinez Royer Paola Ariza.;2018; Safdari, m., arab, b. A., &bagheri, g. A. (2013).)

Material presented is good and covers current developments, the material used examples that can be understood by students. The language used by teachers were appropriate and easily understood by students, teachers actively participate in the learning process

From the observations, in the beginning, it can be concluded that the device prior learning can be accepted with some improvements.

2. Phase design

Based on the availability of facilities and infrastructure that adapts to the learning material to be delivered then used trainer basic electronics. The learning model used in this learning process using model Problem-Based Learning. So that each step of the lesson plan will be developed using the syntax of the learning model based learning that will be developed in accordance with the curriculum of 2013 based on INQF.

Test item construction planning phase begins with the analysis of student assignments, analysis of the concept and purpose of learning so that the grating can be developed as a matter of test.

Questions were made covering aspects of attitudes, knowledge, and skills.

1. Phase of development

At the development stage, there are a few things to do like the following:

- a. In the development phase of this level of validity in the learning device subjects of basic electricity and electronics have been developed, there are some instruments that should be validated first, expert validation performed by 3 experts in their field who an adjunct professor of Technology and Vocational in the Postgraduated Surabaya State of University, the following devices are validated and the results of the validation.

Table 1. Results of the validation device

No.	Device	Rearata	Category
1	Syllabus	3.3	Valid
2	RPP	3.0	Valid
3	LKS	3.3	Valid
4	Lembar Penilaian	3.2	Valid

Problem declared invalid if $r_{\text{arithmetic}} > r_{\text{table}}$ (on sig 0, 05, $n = 30$, $df = 28$, amounting to 0.357), the matter of which fall into the category valid.

Reliability problems are only done on a matter that is in the category of very valid and invalid. Problem is declared reliable if the Cronbach's alpha value of 0.725, which means greater than 0.07 because it was a matter categorized reliable.

Table 2. Levels of reliable

Cronbach's alpha	Internal consistency
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$0.5 > \alpha$	Unacceptable

In the stage of the pilot phase of development in the review from the level of practicality basic subjects learning device electrical and electronics that have been developed are as follows:

the criteria to declare that the device is practical learning if a minimum level of practicality of the device is achieved is practical. The following ranges are used for interpretation of the data practicality of the device

Table 3. Practicality Assessment Criteria

Range	Assessment criteria
1 s / d 1.6	Not practical
1.7 s / d 2.5	Less practical
2.6s / d 3.3	Practical
3.4 s / d 4	very practical

Results of practical aspects of learning tools obtain a mean score of 3.92 with very practical criteria.

In the phase of the pilot phase of development in the review of the effectiveness of the learning device subjects of basic electricity and electronics that have been developed are as follows:

The criteria to declare that the device is effective learning is if the purpose of learning undertaken by students has terrapin and enforceability of the learning that has been tested to the students well. Aspects of the effectiveness of the learning device obtain the average score of student learning outcomes by 3.86% with effective criteria

- b. Phase-In the test phase review of the development in terms of students' responses to the learning device basic subjects of electrical and electronics that have been developed are as follows:

The response of students to learning device obtained a mean score of 96% is very satisfying criteria

Table 3. Response of students

No.	Aspect	Percentage	Criteria
1	Material	96	Very satisfactory
2	Worksheet	98	Very satisfied

3	Model	97	Very satisfied
4	Rating	95	Very satisfied

Known that 94% of students liked the learning device which has been prepared. In other words, the device gets response positive learning of students.

- c. In the pilot phase of development in terms of learning outcomes of students' learning device subjects of basic electricity and electronics that have been developed are as follows: after the implementation of learning student learning outcomes for the better, student learning outcomes include assessment of attitudes, knowledge and skills, completeness of student learning outcomes acquired 100% of students. completed the study, with an average value of 85 above the value of the Minimum Criterion has been determined. From these results, the absorption material is excellent after the learning process implemented.

2. Phase disseminate

In the deployment, the phase is done by spreading the learning device in the Vocational Education Unit KAL-1 Surabaya.

CONCLUSION

Based on descriptive analysis curriculum development learning device 2013 based on INQF in learning activities that get the results of this study as follows:

1. The level of validity, practicality, effectiveness of learning tools that have been developed:

From the aspect of validity, the learning device obtaining a mean score of 3.3 with the criteria very valid, practical aspects of learning tools obtain a mean score of 3.92 with a very practical criterion, and aspect of the effectiveness of the learning device obtain the average score of student learning outcomes by 3.86% with effective criteria.

2. Students 'response to learning tools which have been developed:

Students' response to the learning device obtained a mean score of 96% is very satisfactory criteria.

3. Student learning outcomes:

Learning outcomes of students scored an average grade of 85 over the Minimum Criterion that has been set, the learning completeness 100%

SUGGESTIONS

1. Election many materials each group will be describing the nuance so that when displaying the results of the experiment can provide an overview of the other students.
2. Given the hypothesis testing process takes a long time, then the available time well regulated so as to be efficient and effective.
3. There are many different types of designs that can be used in research development. Therefore, it is important to master research designs used for the implementation of the research can proceed smoothly and in line with expectations.

LIMITATIONS OF THE RESEARCH

This makes modifications to the study design stage 4D, by not doing limited testing as appropriate stages in the research design 4Din general. This is because the number of students is in the school where the implementation of research, namely Vocational High School KAL 1 Surabaya has only 1 study to Audio Video Engineering program expertise with the students 34 people.

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